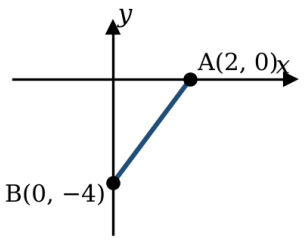
Day 186 **A Level Maths: C Tier 10-a-day**

1 A drone moves with constant velocity $(-6\mathbf{i} + 8\mathbf{j})$ m s^{-1}.
At time t = 0 its position vector is $(-4\mathbf{i} - \mathbf{j})$ m.
(a) Find its position vector when t = 6.
(b) Find the distance it travels in 6 s.

2 Solve $e^{2x + 3} = 50$.
Give your answer to 3 significant figures.

3 The diagram shows a line meeting the axes at A and B.
Find (a) the equation of AB in the form px + qy = r with integers p, q and r, (b) the length AB.



4 A population is N(μ, 5^2). H_0: μ = 35, H_1: μ < 35.
A sample of 9 has mean $\bar{x} = 31$.
Test at the 5% level. Critical value: z = −1.645.

5 Solve ln (x + 8) − ln x = ln 5.

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6 Solve the simultaneous equations: $y = x^2 - 3x + 1$, $y = 3x - 4$.	
7 $a = 3\mathbf{j} - \mathbf{k}$ and $b = \mathbf{i} - \mathbf{j} - \mathbf{k}$. Find the angle between a and b, to 1 decimal place.	
8 A particle moves in a straight line. Its displacement from O at time t seconds is s metres, where $s = 3t^3 + 3t^2 + 4t$. Find its velocity when $t = 2$.	
9 The values x are coded using $y = (x - 50) \div 5$. The coded values have mean $\bar{y} = 2.9$ and standard deviation 0.5. Find the mean and standard deviation of x.	
10 The curve $y = x^2 + 2x - 1$ is translated by the vector $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$. Find the equation of the new curve, giving your answer in the form $y = ax^2 + bx + c$.	